



Docket No.: M4065.0372/P372
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Stephen L. James

Application No.: 09/808,156

Filed: March 15, 2001

For: SINGLE SIDED ADHESIVE TAPE FOR
COMPOUND DIVERSION ON BOC
SUBSTRATES

Group Art Unit: 2841

Examiner: J. Norris

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AMENDMENT

Box Non-Fee Amendment

Commissioner for Patents
Washington, DC 20231

Dear Sir:

In response to the Office Action dated March 28, 2002 (Paper No. 2), please
amend the above-identified U.S. Patent application as follows:

In the Claims:

Please amend the claims to read as follows:

37. (Amended) The method of claim 36, wherein said step of securing said
third material comprises securing said third material on said die.

38. (Amended) The method of claim 36, wherein said step of securing said
third material comprises securing said third material on said circuit board.

39. (Amended) The method of claim 36, wherein said step of securing said third material comprises applying a thin layer of material on said die, said thin layer of material contacting said first and second adhesive materials to form a diversion dam.

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40. (Amended) The method of claim 36, wherein said step of securing said third material comprises applying a thin layer of material on said circuit board, said thin layer of material contacting said first and second adhesive materials to form a diversion dam.

In the Abstract of the Disclosure:

Please amend the abstract to read as follows:

An adhesive system and a method of adhesion for a ball grid array semi-conductor device package facilitate the encapsulation of a die attached to a circuit board. A material is added between a die and a circuit board tape, and is oriented perpendicular to a conventional two-piece tape system used to attach the die to the circuit board. The material, which is located across from a gate through which an encapsulation compound is injected to form a package, acts as a diversion dam. The material thereby enables the injected encapsulation compound to fill a wirebond slot last and avoid an overflow which might otherwise damage the ball grid array.

REMARKS

Reconsideration and allowance of this application, as amended, are respectfully requested. The Abstract of the Disclosure, the drawings, and claims 39-40 have been amended. Claims 1-40 remain pending in the application. The rejections are respectfully submitted to be obviated in view of the amendments and remarks presented herein. Applicant reserves the right to pursue the original claims and other claims in this application and in other applications.

Applicant acknowledges with gratitude the indication that claims 23-29 are allowed. The Abstract of the Disclosure has been amended as required by the Office Action, and has been further editorially amended for improved readability. Drawing Figs. 1(c) and 2 have been amended to include crosshatching as required by the Office Action. Claims 37-40 have been editorially amended in response to the rejections under § 112, second paragraph. Reconsideration and withdrawal of the rejections thereunder are respectfully requested.

35 U.S.C. § 102(b) - Kinsman

Claims 1-5, 8-10, 30-33, 36, 39, and 40 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 5,789,803 to Kinsman (hereinafter "Kinsman"). The Office Action asserts in pertinent part that "Kinsman discloses, referring to figures 3A-3FF, a structure for use in a semiconductor package, said structure comprising: . . . a third material (*not shown*) provided on said circuit board and extending between said first and second materials to form a diversion dam for an encapsulation material (see col. 5, lines 40-45) [claim 1], . . . wherein said third material is

a thin layer of material applied to one or both of said die and said circuit board, at a location adapted to face an inlet for an encapsulation compound (see col. 5, lines 40-45) [claim 8], wherein said third material resides on said die [claim 9], wherein said third material resides on said circuit board [claim 10]” (emphasis added).

The rejection of claims 1-5, 8-10, 30-33, 36, 39, and 40 under § 102(b) as being anticipated by Kinsman is respectfully traversed. For at least the following reasons, the disclosure of Kinsman does not anticipate Applicant’s claimed invention.

Applicant’s claim 1 defines a structure comprising, *inter alia*, “a third material provided on said circuit board and extending between said first and second materials to form a diversion dam for an encapsulation material.”

The above-quoted ground of rejection relied upon in the Office Action, purportedly describing the disclosure of Kinsman, is respectfully submitted to be an inaccurate characterization of the disclosure of Kinsman. With regard to Applicant’s claimed third material, the Office Action (page 4, lines 6-8) relies upon the disclosure of Kinsman at column 5, lines 40-45. At column 5, lines 37-45, Kinsman discloses the following:

For applying the encapsulation material 40 as a glob top there are two preferred methods. A first preferred method is to simply dispense the encapsulation material 40 directly over the wire bonded area of the die 10 and leadframe 12. A second preferred method is to dispense a continuous bead of one material with a higher viscosity around the perimeter of the wire bonded area as a dam and then fill the center area with a less viscous material.

First, as even the Office Action acknowledges, the drawings of Kinsman do not even show any third material. Secondly, there is no disclosure whatsoever in Kinsman of any structural element that would anticipate Applicant's claimed structure having "a third material provided on said circuit board and extending between said first and second materials to form a diversion dam for an encapsulation material." The Office Action relies upon the disclosure of Kinsman's "figures 3A-3FF" (paragraph bridging Office Action pages 3-4). As is evident from reviewing Kinsman's Figs. 3A-3FF and the associated written description, however, Kinsman discloses no structure that would anticipate Applicant's claimed structure having a third material. In fact, it would be impossible to fabricate Applicant's claimed structure by following the sequence of assembly steps disclosed by Kinsman.

For example, at column 4, lines 43-44, Kinsman teaches that "[w]ith reference to FIG. 3A, a die 10 is attached to the leadframe 12 using an adhesive 36." Then, at column 4, lines 55-57, Kinsman teaches that "[a]s shown in FIG. 3B, each die 10 is laminated to the leadframe 12 by pressing the die 10 against the leadframe 12 with the adhesive 36 sandwiched therebetween." Then, at column 5, lines 12-13, Kinsman teaches that "[n]ext, as shown in FIG. 3D, an encapsulating material 40 is applied to the face of the die 10 and lead fingers 28." Finally, as indicated above, at column 5, lines 37-45, Kinsman discloses the application of the encapsulation material, such as for example, applying "a continuous bead of one material with a higher viscosity around the perimeter of the wire bonded area as a dam and then fill the center area with a less viscous material."

Thus, the structure that results from Kinsman's method of assembly is different from Applicant's claimed structure. Kinsman's continuous bead of one material is applied only after the die and leadframe have already been attached to one another, i.e., "each die 10 is laminated to the leadframe 12 by pressing the die 10 against the leadframe 12 with the adhesive 36 sandwiched therebetween." Therefore, the only constituent between Kinsman's die and leadframe is adhesive 36 (see Kinsman Figs. 3A and 3B).

In Applicant's claimed structure, however, not only are the first and second adhesive materials "provided between a die and a circuit board," but a third material is provided "*on said circuit board and extending between said first and second materials* to form a diversion dam for an encapsulation material." (See Applicant's Fig. 2.) Thus, by definition, Applicant's claimed third material is located between the die and the circuit board; Kinsman's bead of material is not.

Claim 30, which defines a structure having first and second pieces of "double side adhesive tape secured between said die and said circuit board" and "a thin layer of material provided between said first and second pieces of doubled sided adhesive tape to form an encapsulation diversion dam" is similarly allowable. The dependent claims are allowable along with independent claims 1, 30, and 36, and on their own merits.

For at least the above reasons, reconsideration and withdrawal of the rejection of claims 1-5, 8-10, 30-33, 36, 39, and 40 under § 102(b) are respectfully requested.

35 U.S.C. § 103(a) - Kinsman in view of Murakami; Kinsman in view of Murakami and Frantz; Kinsman '764

Claims 11 and 34 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kinsman in view of U.S. Patent No. 6,124,629 to Murakami et al. (“Murakami”); claims 12-16 and 19-22 stand rejected under § 103(a) as allegedly being unpatentable over Kinsman in view of Murakami and U.S. Patent No. 6,285,558 to Frantz et al. (“Frantz”); and claim 35 stands rejected under § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,159,764 to Kinsman (“Kinsman '764”).

For all of the reasons identified above with respect the rejection under § 102(b), each of the rejections under § 103(a) is similarly respectfully traversed. The Office Action relies upon the secondary references and Kinsman '764 for their purported teachings related to limitations such as Applicant's claimed memory die (claim 11) and processor (claim 12). Regardless of any such teachings, none of the secondary references or Kinsman '764 rectifies the deficiency associated with Kinsman, i.e., the failure to anticipate Applicant's claimed structure with the third material located between the die and the circuit board. Thus, the combined disclosures would not have rendered obvious the embodiments of the invention defined by any of the rejected claims.

For at least the above reasons, reconsideration and withdrawal of each of the rejections under § 103(a) are respectfully requested.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

Dated: June 28, 2002

Respectfully submitted,

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